OFFICE OF THE COMMISSIONER
(850) 617-7700

THE CAPITOL
400 SOUTH MONROE STREET
TALLAHASSEE, FLORIDA 32399-0800

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

COMMISSIONER ADAM H. PUTNAM

February 19, 2014

Ms. Tawanda Maignan
Emergency Response Team
U.S. EPA, Office of Pesticide Programs (7505P)
Document Processing Desk (EMEX)
Room S4900, One Potomac Yard
2777 Crystal Drive
Arlington, Virginia 22202

Dear Ms. Maignan:

Enclosed is a FIFRA Section 18 specific exemption petition submitted on behalf of Florida growers for the use of Belay® Insecticide (clothianidin) to manage the transmission of Huanglongbing (HLB) disease caused by the Asian citrus psyllid (ACP) on immature citrus trees. The attached petition and accompanying materials provide the details of this request. This is our first exemption request seeking the Agency's approval for controlling the ACP with this active ingredient. A one year exemption period is requested.

In 2005, HLB (also known as citrus greening disease) was first identified in Florida. This disease is caused by the pathogen *Candidatus Liberibacter asiaticus* and is spread by the ACP (*Diaphorina citri* Kuwayama), an invasive pest that was first discovered in Florida in 1998. HLB is considered the most serious disease of citrus worldwide and has greatly limited commercial production of citrus in countries where it is present. Since its discovery in Florida, this disease has rapidly spread throughout the citrus production area to the extent that it is currently found in all commercial production areas in the state.

Approximately 90% of Florida's citrus harvest is processed for juice. With the rapid decline of HLB-infected mature citrus trees and falling yields, Florida's citrus is nearing the critical point where the supplies of fruit may become inadequate to sustain our juice-processing infrastructure. Extensive research is underway to develop lasting solutions to HLB (such as disease-resistant cultivars), but until this work reaches fruition, the industry must rely upon replanting new trees and protecting them to full production age without high levels of HLB infestation. Economic analysis shows that losing as few as five percent of young citrus trees currently in the ground to HLB will result in lost viability of long-term production.

The only mechanism presently available to sustain young trees is the soil-application of neonicotinoid insecticides at a frequency adequate to ensure protection from infected ACP. A unique feature of soil-applied neonicotinoid insecticides (including clothianidin) is their ability to deter the feeding behavior of the psyllid vector, preventing its ability to inject HLB bacteria into the host tree tissue. The systemic protection conferred by soil application of neonicotinoids is more long-lasting and superior to that provided by foliar-applied neonicotinoids. Currently, research and field experience is showing that citrus

trees less than 3 years old can be adequately protected with available neonicotinoids labeled for soil application, but immature trees aged 3 to 5 years-old are manifesting a rapid increase in HLB. This breakdown in protection is due to gaps in coverage with soil applied neonicotinoids, because current label restrictions for these trees do not allow for the necessary timing or per acre per year rates needed to provide year-round anti-feeding behavior. In particular, bearing trees 3 to 5 years-old cannot receive clothianidin soil treatments since a label for bearing citrus is lacking.

Trees that would be treated with clothianidin under the Section 18 (3 to 5 year-old trees, 5 to 9 feet tall) can be expected to reach production levels that would approximate the level of yields in young trees prior to introduction of the pest and disease (approximately 2 to 3 boxes of fruit per tree). Without the protection afforded by the use of clothianidin, the trees do not reach market maturity before succumbing to the symptoms of the disease, and this results in the complete loss of any productive value. Lacking this Section 18, growers will not be able to grow out the replacement stocks that are critically needed to help them hold out until longer-term remedies are available. The use of clothianidin as described in this petition is the most critical step growers can take now to help protect the future of their groves and the Florida citrus industry as we know it.

The department has reviewed and/or consulted with the affected agencies and determined that use of this insecticide under the conditions of this proposed specific exemption will not pose a risk to endangered species.

Please refer to the petition and materials attached for documentation supporting this specific exemption request. If you have any questions in connection with this request or if there is any further information you will need for your review, please contact Mr. Charlie L. Clark or Ms. Kimberly Williams of my staff, (850) 617-7940.

We greatly appreciate your consideration of our exemption request.

Sincerely,

Adam H. Putnam
Commissioner of Agriculture

AHP/kw

Enclosures

THIRD PARTY REGISTRATIONS INC.

February 12, 2014

Mr. Charlie Clark
Environmental Administrator
Florida Department of Agriculture and Consumer Services
3125 Conner Blvd, Bldg. 6
Tallahassee, Florida 32399-1650

Dear Mr. Clark:

On behalf the citrus industry in Florida, Third Party Registrations, Inc. in cooperation with the Florida Fruit & Vegetable Association and Florida Citrus Mutual is seeking your assistance in petitioning the EPA for a Section 18 Emergency Exemption (specific) for the use of Belay 2.13 SC Insecticide (clothianidin) in young citrus trees to prevent the introduction of the causal agent Candidatus *Liberbacter asiaticus* (Huanglongbing (HLB) or Citrus greening disease) by its insect vector the Asian Citrus Psyllid (*Diaphorina citrii*). As the citrus industry has struggled to manage the incidence and severity of this invasive disease and vector complex, it has become apparent that the future of the industry is at risk as a result of the lack of an effective means to limit the infection level of young trees that actively flush all year long. Research from the University of Florida, IFAS has shown that season long protection can be accomplished through the soil application of tree-size specific doses of neonicotinoid insecticides (imidacloprid, thiamethoxam, and clothianidin). This treatment regime is not currently available due to the lack of a bearing citrus label (and tolerance) for the active ingredient clothianidin that would allow Belay 2.13 SC Insecticide use on 3 to 5 year old, 5 to 9' tall trees.

The Environmental Protection Agency was petitioned for a label expansion for this active ingredient to allow this use by Valent U.S.A., Corporation with tolerance data provided by the IR-4 program over four years ago. The petition has been reviewed and is on hold due to pending litigation concerning the original registration of this active ingredient and its alleged impact on bees. The use pattern and application methodology requested under this petition was developed to minimize direct impacts to bees. The potential for indirect exposure created through exposure to nectar of treated trees is also minimized as a result of application timing restrictions to reduce potential levels of the active ingredient during the bloom period of citrus that is important to the beekeeping and Honey industry. The State of Florida has also actively engaged the two industries in a cooperative communication process and developed a program to provide guidance to the industries in their efforts to ensure mutually beneficial practices for the continued production of citrus and the health of honey bees that visit citrus groves. This program is detailed at the website: www.floridabeeprotection.org.

If approved, this specific exemption will allow citrus growers to confidently schedule production of nursery trees to plant in to commercial groves with the expectation that they will reach maturity with a minimal level of infestation of HLB. If growers cannot begin the protection program starting with the 4.95 million trees that were planted over

Post Office Box 948153 • Maitland, Florida 32794-8153 • Phone (321) 210-5200 • Fax (321) 214-0210

the three year period of 2007-2009 that are already in the ground, the very rapid decline of mature groves as a result of HLB that became apparent over the past two years (decline in production from 150 M to an estimated 110 M boxes for this season) will result in the loss of the packing and processing infrastructure that sustains this industry in Florida. The first application needed this season under this petition could occur as early as mid-March (depending on the end of the bloom period).

Thank you in advance for your attention to this matter in an expedited manner. If you, or anyone else within the Department, have any questions regarding this request, please do not hesitate to call.

Sincerely,

Daniel A. Botts
President
Third Party Registrations, Inc.

FFVA
FLORIDA FRUIT
&VEGETABLE ASSOCIATION

Michael J. Stuart
President

FLORIDA CITRUS MUTUAL

Michael W. Sparks
Executive Vice President and CEO

Attachment:

Section 18 Petition: Belay 2.13 SC Insecticide on commercial Planting of Young Citrus

Cc: The Honorable Adam Putnam, Commissioner of Agriculture, FDACS
Dr. Lisa Conti, Deputy Commissioner of Agriculture, FDACS
Mr. Anderson "Andy" Rackley, Division Director, Agricultural Environmental Services, FDACS
Dr. Dennis Howard, Bureau Chief, Bureau of Pesticides, FDACS
Mr. Randy Dominy, EPA Region IV
Dr. Richard Allen, Valent U.S.A. Corporation
Ms. Sue Shen, Valent U.S.A. Corporation
Mr. Jeff Smith, Valent U.S.A. Corporation

EMERGENCY EXEMPTION REQUEST

(Specific Exemption)

FOR THE USE OF

Belay® Insecticide (clothianidin)

TO MANAGE

Transmission of Huanglongbing (HLB) Disease caused by the Asian Citrus Psyllid (ACP)

ON

Immature Citrus Trees
(Citrus tree replants – 5 years or less in age, up to 9 feet tall)
In Commercial Groves

IN FLORIDA

February 18, 2014

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CONTACT PERSON(S) AND QUALIFIED EXPERTS(S) (166.20(a)(1)):

(i) The Contact Person for matters relating to the administration of this exemption:

Daniel A. Botts
Florida Fruit & Vegetable Association
800 Trafalgar Ct.; Suite 200
Post Office Box 948153
Maitland, FL 32794-8153
Phone: (321) 214-5200
Fax: (321) 214-0210
daniel.botts@ffva.com

Charlie Clark, Environmental Admin.
FL Dept. of Ag and Consumer Services
Pesticide Registration Section
3125 Conner Blvd. (Bldg. 6)
Tallahassee, FL 32399-1650
Phone: (850) 617-7940
Fax: (850) 617-7949
charlie.clark@freshfromflorida.com

Jeff Smith, Southeastern Region Technical Support
Valent U.S.A. Corporation
195 West Creek Court
Peachtree City, GA 30269
Mobile: (602) 999-1184
Fax: (925) 999-5122
Jeffrey.Smith@valent.com

(ii) The contact people for matters relating to the technical aspects of this exemption:

For Florida, it has been agreed that questions relating to technical aspects in the field for this emergency exemption petition will work through the Florida Department of Agriculture and Consumer Services and the Emergency Response Team within EPA's OPP.

DESCRIPTION OF PESTICIDE REQUESTED (166.20(A)(2)):

a. Common Chemical Name (Active Ingredient):

Clothianidin

Trade Name and EPA Registration Number:

Belay® Insecticide
EPA Registration Number: 59639-150

Formulation:

Suspension Concentrate

Percent Active Ingredient:

23.60% (2.13 lb clothianidin per gallon)

Manufacturer:

Valent U.S.A. Corporation

b. Additional labeling:

See Appendix A for a proposed Section 18 label for Belay® Insecticide, the current 24(c) for Belay® 50 WDG Insecticide (EPA Reg. No. 59639-152, and EPA SLN No. FL-110001) for non-bearing citrus, the current Belay® Insecticide (EPA Reg. No. 59639-150) label, and the master label for Belay® Insecticide submitted to EPA by Valent U.S.A. Corporation as part of the pending action to expand the use of Belay® Insecticide to bearing citrus. In addition, the Material Safety Data Sheet for Belay® Insecticide is included.

As discussed in the support letter from Valent U.S.A. Corporation, the company has announced its intention to discontinue all agricultural uses associated with the WDG formulation. Once the pending labelling action is taken at EPA, all SLN 24(c) registrations will be shifted to the Section 3 label for Belay® Insecticide (EPA Reg. No. 59639-150).

DESCRIPTION OF PROPOSED USE (166.20(A)(3)):

(i) Sites to be Treated:

The sites to be treated include immature citrus trees in commercial citrus groves in Florida. An existing Florida Special Local Need registration (Belay® 50 WDG insecticide label, EPA Reg. No. 59639-152, FL110001) currently allows young citrus trees ranging in age from new plantings or resets (less than 3 feet tall) to two years old, to receive a measured dose of clothianidin directed at the base of the individual tree. Under the SLN, the per tree use rate is dependent on the age and size of the tree as follows: a) replants less than 1 year old (less than 3 feet tall) may receive soil applied clothianidin at an application rate of 0.0003 lb ai per tree; immature trees 1 to 2 years old (3-5' tall) may receive soil applied clothianidin at an application rate of 0.0007 lb ai per tree. This Section 18 petition seeks to expand the use of Belay® Insecticide (EPA Reg. No. 59639-150) to allow soil applications to the base of 3 to 5 year old trees (5-9 feet tall) at the per tree use rate of 0.0013 lb ai per tree. A maximum of two applications at this rate could be made under the specific exemption to 3 to 5 year-old trees. The use rates are based on the maximum broadcast use rate on the Belay® 50 WDG SLN and total active ingredient per acre per season on that label.

(ii) Method of Application:

Ground, soil application only, using the industry standard low pressure, large nozzle, hand-wand applicator. Individual trees would be treated with a spray application to the soil at the base of the tree. Areas to be treated are to be as weed free as possible.

(iii) Rates of Application (in terms of a.i. and product):

The maximum rate of application of Belay® Insecticide would be on trees 3 to 5 years old and 5 to 9 feet tall. For solid plantings (150 trees per acre), this would translate to 0.2 lb ai or 12 fluid oz of product per acre per application with a maximum of 0.4 lb ai per acre or 24 fluid oz of product per acre per year. In replant situations within existing groves, this rate would be limited to two applications per calendar year.

Maximum Number of Applications:

As a result of the rate differential for different size and age trees, on smaller trees the number of applications (under the current Belay® 50 WDG SLN Insecticide and allowed for on this Section 18) can be more than two in a calendar year but would be held to the same maximum of material per

treated area. For example, the SLN allows trees 1 to 2 years old, 3 to 5 feet tall to be treated 4 times at the use rate of 0.04 oz (0.0007 lb ai per tree) and trees less than 1 year-old, less than 3 feet tall could be treated up to 8 times during a calendar year (0.02 oz, 0.0003 lb ai per tree). The smaller tree size use rates and label conditions are currently approved under the 24(c) Belay® 50 WDG Insecticide label, EPA Reg. No. 59639-152, FL110001. The only additional use of clothianidin under the requested specific exemption would be on trees 3 to 5 years old 5 to 9 feet tall.

(iv) Total Acreage (or other units) to be Treated:

According to the NASS Commercial Inventory Preliminary report, issued September 19, 2013 (Appendix C) there are 68.974 million trees in commercial plantings for all varieties of citrus in Florida. For calculating the per-tree use rate for Belay® Insecticide a tree density of 150 trees per acre was used. The number of trees that could be treated under the Section 18 for use of Belay® Insecticide is as shown in the following table:

NASS, Commercial Citrus Inventory Preliminary Report September 2013		
Planting Year	Tree Age Class	Number of Trees (x 1,000)
2012	Up to One Year	1,137.7
2010 & 2011	One and Two Years	3,361.6
2007, 2008 & 2009	Three through Five Years	4,959.7

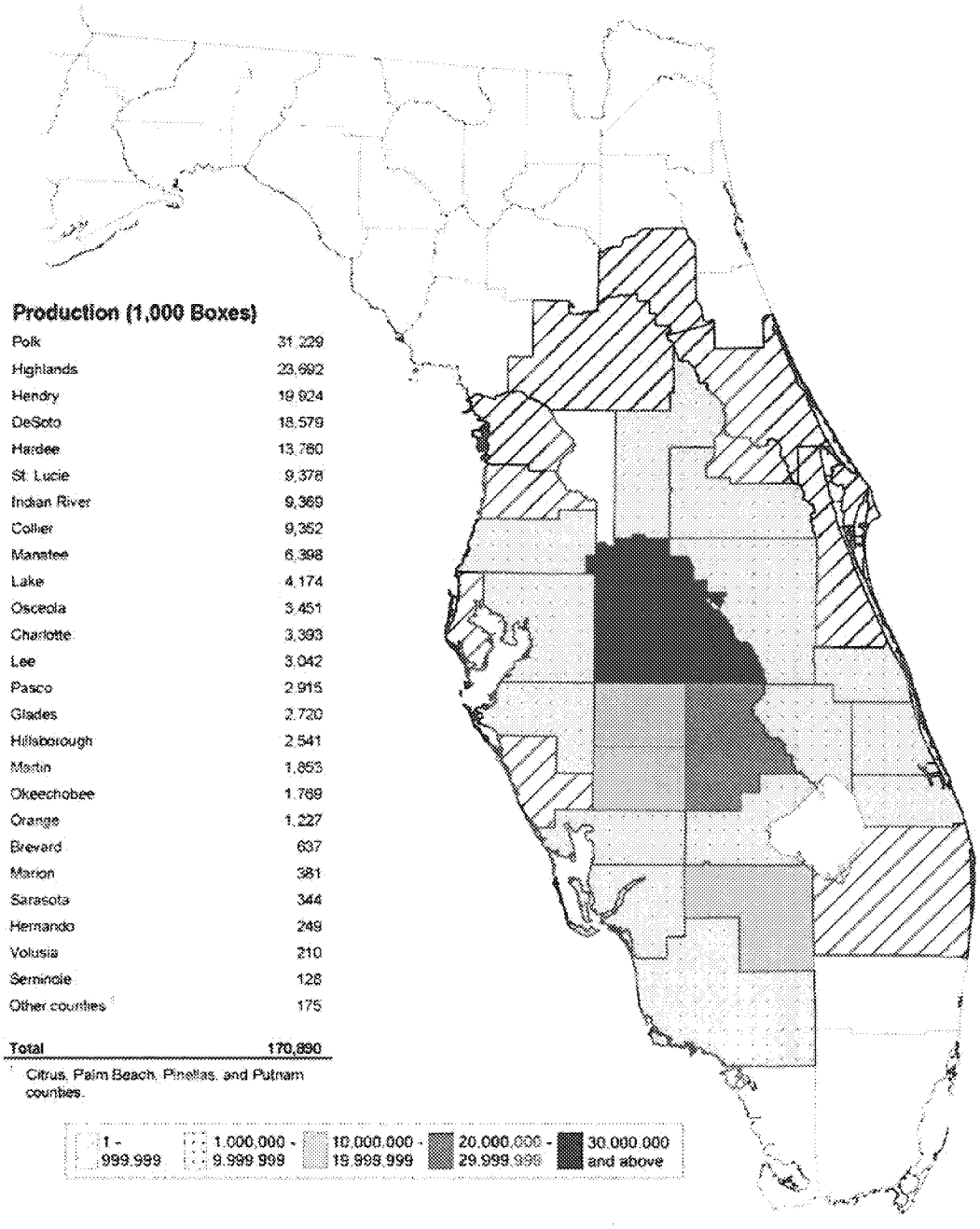
Of the total commercial citrus trees in Florida, 6.4% are considered young non-bearing trees that are covered by the existing SLN for clothianidin; 7.2% are considered bearing trees 3 to 5 years old that could be treated under the specific exemption (See Figure on following page for citrus production counties of Florida).

(v) Total Amount of Pesticide to be Used (in terms of a.i. and product):

The additional amount of clothianidin that could be used under the specific exemption for the trees 5 to 9 feet tall would be a total of 12,895.22 lb ai (two applications at 0.0013 lb ai per tree). This amount of active ingredient would equal 6,054 gallons of Belay® Insecticide. Each gallon contains 2.13 lbs active ingredient.

If all three tree size classes received the maximum number of applications, the use of clothianidin in the young tree protection program would total 25,036.8 lb ai or 11,754 gallons of product per year.

Citrus Production by County 2011-2012



Production (1,000 Boxes)	
Polk	31,229
Highlands	23,692
Hendry	19,924
DeSoto	18,579
Hardee	13,780
St. Lucie	9,378
Indian River	9,369
Collier	9,352
Manatee	6,398
Lake	4,174
Osceola	3,451
Charlotte	3,393
Lee	3,042
Pasco	2,915
Glades	2,720
Hillsborough	2,541
Martin	1,853
Okeechobee	1,769
Orange	1,227
Brevard	637
Marion	381
Sarasota	344
Hernando	249
Volusia	210
Seminole	128
Other counties	175
Total	**170,890**

Citrus, Palm Beach, Pinellas, and Putnam counties.

Cover photograph courtesy of Michael S. Labbe

(vi) Use Season (period of time for which use of chemical is requested):

The use of clothianidin under this young tree protection program would be spaced through the leaf flush period for young trees, which can occur virtually year-round. For purposes of this exemption on the 3 to 5 year-old trees, the use period would begin after the major bloom period ends (typically late March) and would extend to November 1. The University of Florida in cooperation with FDACS Division of Plant Industry, Bureau of Apiary Inspection has developed a methodology to be used in the citrus industry to document the start and end of the bloom period in Florida citrus (included in Appendix C). Also attached is a document prepared by Dr. Michael Rogers, IFAS, University of Florida that characterizes the application program for young trees across the soil-applied neonicotinoid insecticides (imidacloprid, thiamethoxam and clothianidin) to achieve the most efficacious prevention of HLB inoculation by infected Asian citrus psyllid.

(vii) Additional Restrictions, User Precautions and Requirements, Qualifications of Applicators, etc.:

For this particular exemption request, the industry will follow a use pattern that completely avoids the major bloom period on citrus (no application from November 1st through petal fall of the following bloom period). Other aspects of the use restrictions include application of a low pressure, course spray to bare soil at the base of the tree that will minimize drift and virtually eliminate the potential for direct deposit of residues on the plant portions subject to be visited by pollinators in the crop. In addition, the Section 18 label advises that the application site around the base of the tree should be as weed free as possible.

As a result of concerns over impacts to pollinators from the class of compounds that includes clothianidin, the citrus industry, University of Florida - IFAS and registrants have been working with the Florida Department of Agriculture and Consumer Services to develop a mitigation program to minimize risks to managed pollinators. The Florida Bee Protection Program (www.floridabeeprotection.org) provides information to Florida growers and beekeepers on the risks that pesticides can pose to bees and identifies measures that growers and beekeepers can adopt to protect both crops and honey bee colonies. The website, which is referenced on the Section 18 label, also provides information to both beekeepers and citrus growers on HLB and the current strategy that focuses on coordinated management of the Asian citrus psyllid. An online mapping tool is available that provides the location of commercial citrus groves including those that consist of predominately mature trees and groves that consist of reset blocks that have been replanted within the past

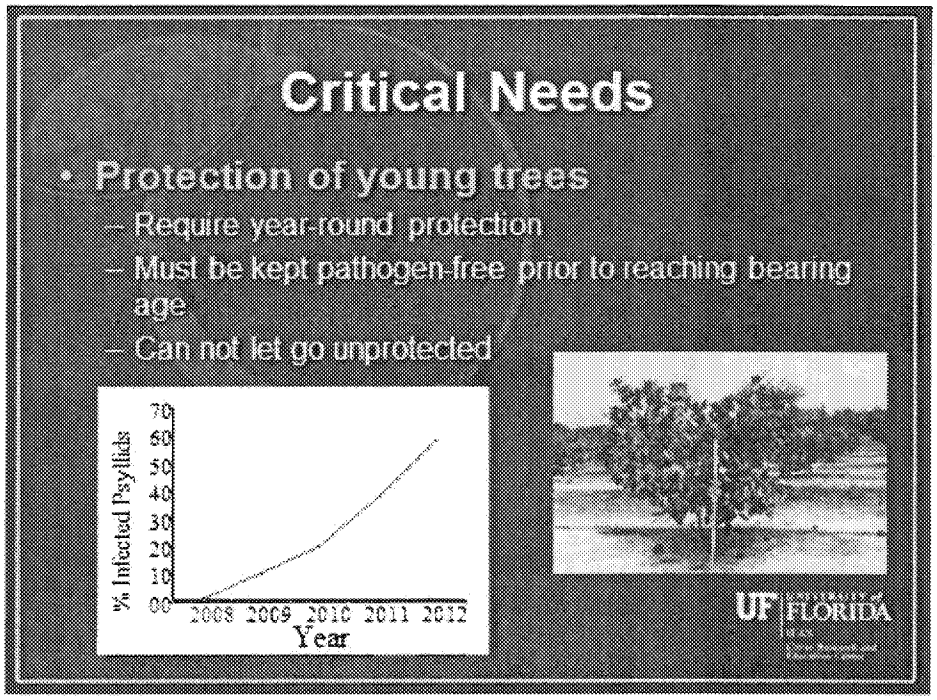
5 years. This information is available to beekeepers to identify areas that may have been treated with the soil applied neonicotinoids and could pose risks to foraging bees when in bloom. Links to citrus grower contact information are provided on the map and beekeepers can also report their approximate hive location and contact information to help growers communicate with them. Finally, the map contains overlays of alternative forage areas for honey bees.

ALTERNATIVE METHODS OF CONTROL (166.20(A)(4)):

(i) Detailed Explanation of Why Currently Registered Pesticides Are Not Available in Adequate Supply and/or Are Not Effective to Control the Emergency:

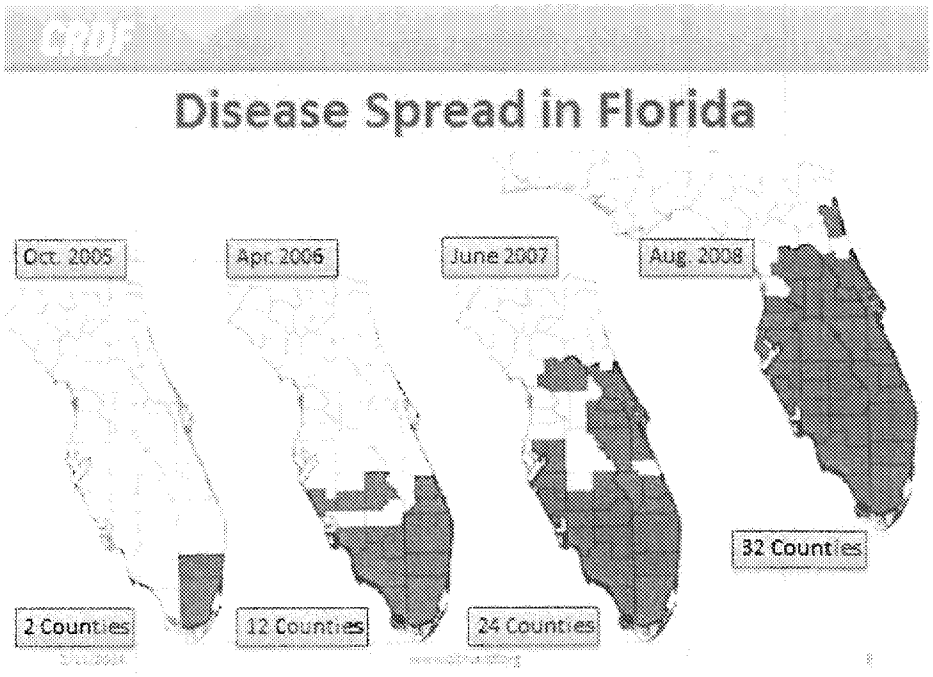
This emergency exemption is based in large part upon a unique characteristic of the soil-applied neonicotinoids. Specifically, the use of neonicotinoids in this manner interrupts feeding behavior by the Asian citrus psyllid and thereby effectively prevents the psyllid from transmitting the disease into uninfected trees well before the insect is killed by the insecticide. This anti-feeding effect of the neonicotinoids is not demonstrated with other classes of compounds nor is it as effective in this class of compounds when applied as a foliar treatment. The industry has worked with the other neonicotinoid registrants to maximize the use of these soil–applied products in young citrus and at the present time the only option available is the expansion of the current non-bearing use pattern to the larger minimally bearing citrus trees in the 3 - 5 year-old age class.

Since the initial discovery of HLB in Florida in 2005, the incidence level of *Liberibacter* infected "hot" psyllids has steadily increased to essentially 100% of psyllids tested now being positive for the presence of the *Liberibacter* in their mid-gut and saliva.



Michael Rogers, Presentation to the FDACS Citrus Industry Beekeeper Meeting, September 18, 2014

This fact coupled with the high level of infected trees across the whole production area makes the protection of the young trees much more difficult.



From: Tom Turpen, Presentation to EPA, February 5, 2014

The ability to prevent the spread of the disease is totally dependent on the prevention of a "hot" psyllid from infecting the vascular system in the replants and allowing the young trees to reach near maturity at the lowest infection level possible. Where we have the ability to provide season-long anti-feeding protection in the non-bearing trees, the level of infection has been held to single digit percentages. However, in the inadequately protected 3 to 5 year-old trees, the infection rate climbed to double-digit percentages (often above 50% infestation levels). At this level of infestation, the tree (and grove) has lost all market potential, as it will never provide economic levels of fruit production.

The future of the citrus industry depends on being able to replace the in-ground productive tree inventory that is rapidly declining as the result of HLB. This program of young tree protection will provide the citrus industry additional time to implement the longer-term strategy of breeding and planting truly resistant horticulturally appropriate varieties and rootstocks.

(ii) Alternative Control Practices:

The disease-vector complex and its impact on the industry has been rapidly increasing since the disease was first identified in Florida in fall of 2005. The fact that HLB was on the U.S. Department of Homeland Security's select agents list made field work next to impossible until that status was modified. As experience with the disease has progressed, it has become apparent that managing the disease at levels that will allow continued commercial production in Florida depends on a multifaceted control strategy. This strategy includes the ability to replace non-productive trees with a realistic expectation that the newly planted replacement trees will have a reasonably productive life.

Even with the complexities created by the lack of ability to culture the bacteria outside of the citrus vascular system and the digestive system of the insect, the industry has made significant strides in identifying the critical components of this management process. The first step is to have maturing trees in commercial settings with very low incidence of disease; this can be accomplished with soil applications of neonicotinoid insecticides.

The next step in managing the impact of the disease is limiting the dispersion and spread of the disease in mature citrus groves. A program involving large acreages conducting voluntary, coordinated applications of pesticides to limit dispersion of the Asian citrus psyllid has been adopted across much of the production area. This program has been designated Citrus Health Management Areas (CHMA). The industry focused on integrating the most effective, low risk compounds into this management program while maintaining the most effective control strategy possible. Included in Appendix C of the petition is the current Florida Citrus Pest Management Guide (available electronically from http://edis.ifas.ufl.edu). This document details the most current recommendations for managing all of the pests of citrus in Florida.

Additional resources have been directed toward identifying potential agents and physical methods to use as therapeutic treatments for infected trees to reduce the development and spread of the disease. There are two primary lines of investigation that show promise: antimicrobials from a range of compounds included in a screening study to determine potential candidates, and, heat treatments of mature infected trees. Both of these lines of investigation are in the early stages of development and are not commercially viable at this time.

While these management components are still emerging, the neonicotinoids coupled with appropriate nutrient management provide the only means to ensure adequate time for development of citrus cultivars that are resistant to the disease.

Several lines of technology are being developed to identify and move the genetic components necessary to convey resistance into horticulturally important cultivars. Field trials have been initiated to further investigate the potential for this to serve as a long-term means of restoring the viability of the industry.

All of this work in the state of Florida is being coordinated through the Citrus Research and Development Foundation (CRDF). This program of research is also coordinated with existing national and international programs through USDA ARS, and industry associations in Texas and California.

EFFICACY OF USE PROPOSED UNDER SECTION 18 (166.20(A)(5)):

The effectiveness of soil application use to prevent transmission of HLB by infected psyllids has been demonstrated through research programs carried out at the University of Florida, IFAS under the direction of Dr. Michael Rogers (Protection of young trees from the Asian citrus psyllid and HLB, January 2012, Citrus Industry, pp 10-15). His research shows the effectiveness of this treatment method for up to six weeks after application when used at the size appropriate dose rate. The anti-feeding behavior has also been demonstrated via electronic monitoring of feeding behavior in the laboratory. This work was published in the Journal of Economic Entomology in 2012 (R.H. Serikawa, et. al., Effects of Soil-Applied Imidacloprid on Asian Citrus Psyllid (Hemiptera: Psyllidae) Feeding Behavior, J. Econ. Entomol. 105(5):1492-1502 (2012)); a copy is included in Appendix C of this petition. While this study pertained to the active ingredient imidacloprid, this same type of anti-feeding behavior and longevity of control is also demonstrated for thiamethoxam and clothianidin.

DISCUSSION OF RESIDUES IN FOOD (166.20(a)(6)):

A citrus fruit group tolerance of 0.5 ppm petition was requested by IR-4 in 2011 to amend 40 CFR parts 180.586(a). The tolerance petition was developed using data generated by the IR-4 Program. This data was generated using foliar applications with 1 day PHI which is a much shorter interval than those proposed with the soil application. An additional residue program (MRID # 486004) - Magnitude of the Residue of Clothianidin in Oranges also includes the soil application up to 0.4 lb ai/A. The soil application did not result in quantifiable residues in fruit. The insignificant uptake by the raw agricultural commodity from soil applications is also supported by the residue studies of grapefruit (MRID# 486002), lemon (MRID#4860003) and grape (MRID# 46346802), up to 1.0 lb.ai/A with 30 days PHI.

DISCUSSION OF RISK INFORMATION (166.20(A)(7)):

Description of application sites, including proximity to residential areas, aquatic systems, endangered or threatened species habitats, soil types, etc.:

Use under the Section 18 will occur in all areas of the state with commercial citrus. The counties are shown in the map on page 7 (Florida Citrus Statistics: 2011-2012, FDACS and USDA NASS, February 2013). Applications will be made to replants in existing groves and any newly transplanted groves that are 3 to 5 years-old. The Section 18 will only add the 3 to 5 year-old, 5 to 9 foot tall subset of trees for potential use. The use rate being proposed is already labeled for use on trees up to 5 feet tall, less than 3 years of age under the non-bearing SLN label in place for clothianidin in Florida.

Possible risks posed by use:

As with any pesticide, there are risks to human health and the environment. In this case most of these risks are managed based on the method of application, temporary tolerance and available room within the dietary risk cup. Further comments are provided below.

While clothianidin can pose risks to aquatic invertebrates, based on its toxicity and persistence in both the terrestrial and aquatic environment, the drift and runoff from a metered, soil-drench application in citrus is less than would be expected from the foliar applications that are currently allowed on the Section 3 label for other crops. In addition, the Section 18 label mandates a 25 foot setback from surface water bodies. Risks to surface water should be no greater than those associated with foliar applications. FDACS has conducted its own review of the risks to surface water quality from the proposed use under the Section 18 and agrees with the above assessment.

As with other neonicotinoids the major potential risk identified resulting from this use would be through the non-target exposure of pollinators to residues of the compound in the nectar of blooming citrus trees.

The nectar residue report entitled "Quantitation of Residues of Clothianidin, TZNG, TZMU in Nectar Following Soil Application of Belay® Insecticide 2.13SC to Citrus" has been submitted to EPA. This report provides the residue results from the nectar samples collected by University of Florida in 2012 and 2013. The report concludes that the residue levels observed in nectar diminished as the time between application and bloom is increased. It is anticipated that applications to less than 15 percent of the total tree population in addition to bracketing the application from the end of full bloom to no later than November 1st will significantly reduce risk to pollinators.

Proposals to mitigate risks:

In a March 29, 2013 Tolerance Assessment document evaluating a request for a citrus tolerance for clothianidin, the EPA reported just 28 percent of either the acute or chronic Population Adjusted Dose was occupied from exposure to clothianidin residues through the diet and drinking water, suggesting significant room in the risk cup for this request to be considered. It is important to note that this 2013 assessment was based on a highly conservative surface drinking water estimate of 72 ppb that, when put into the dietary model, only contributed ~5 percent of the dose. When one considers that 1) less than 10 percent of Floridians consume surface water, 2) estimated ground water concentrations would be significantly less than the 72 ppb, and 3) the highest concentration of clothianidin ever detected in FDACS' citrus shallow monitoring well network is less than 2 ppb, this assessment represents an over-estimate for Floridians. In brief, adding a second application to only a small minority of citrus trees/acreage will negligibly impact ground water concentrations and the dietary risk. FDACS conducted its own modeling simulations using PRZM to estimate pore water concentrations of clothianidin residues and finds that the modeling outputs comport with statements 2) and 3) above, even in very vulnerable regions of Florida (See Appendix D for model outputs).

FDACS reviewed the potential for risks to pollinators and finds the following: Direct (spray) exposure to pollinators is not expected since applications are controlled and targeted only to the soil at the base of the tree. In addition, the application area "should be as weed free as possible" as stated on the label. Consumption of nectar (citrus is not a preferred pollen source) is the primary source of exposure to honey bees and other pollinators from this proposed use. Although data for clothianidin suggests that residues are below levels that would likely impact colonies (<20 ppb), residue levels in nectar may reach levels that result in sub-lethal effects on honey bees when multiple applications of neonicotinoids (imidacloprid, clothianidin, and thiamethoxam) are made throughout the growing season (additive effect for the same mode of action). Sub-lethal effects documented in the literature include impaired feeding, movement, orientation, or homing failure (mortality from failure to return to the colony). However, the proposed applications are limited to only immature trees that are 3 to 5 years old, greatly mitigating risk to bees by reducing the potential for exposure to treated trees during bloom. These trees currently represent only approximately 7 percent of the total citrus acreage (and much fewer blooms) and the overall acreage of citrus "resets" is not likely to substantially grow beyond this rate for the near future given current limitations in the supply of nursery stocks. Significant impacts to honey bee colonies would likely only occur under worst-case exposure scenarios, for example, a colony placed within an area that is predominantly made up citrus blocks that are within 3 to 5 years of age that have been treated with multiple applications of neonicotinoids. To help further reduce this potential risk,

the Florida Department of Agriculture has developed an online mapping tool to help beekeepers locate and avoid reset blocks (1 to 5 year old replanted groves) that may have been treated with soil applied neonicotinoids and could pose risks to foraging bees when in bloom.

A more detailed assessment of the potential for pollinator exposure via consumption of residues in nectar is included in Appendix D.

As a result of concerns over neonicotinoid impacts to pollinators, in 2013 the Florida Department of Agriculture and Consumer Services initiated a workgroup consisting of beekeepers, citrus growers, IFAS researchers, and other stakeholders to enhance protection of both citrus and honey bees. The workgroup sessions resulted in recommendations (Appendix C) for improved communications between the groups, now listed on the FDACS website: www.floridabeeprotection.org. In addition, to help facilitate more efficient communication, an online mapping tool was developed to allow beekeepers to register the approximate location of their hives near citrus. The tool also provides contact information so that beekeepers and growers can easily reach one another for further communication. It includes maps and contact information on Citrus Health Management Areas (CHMA) which growers use to coordinate Asian citrus psyllid monitoring results and synchronize treatment schedules. The mapping tool provides the location of commercial citrus groves distinguishing groves consisting of reset blocks, planted in the past 5 years. This information is available to beekeepers to identify areas that may have been treated with soil-applied neonicotinoids and could pose risks to foraging bees when in bloom. Finally, to help beekeepers find suitable non-crop, alternative locations to place hives, the map identifies alternative natural forage areas.

In addition, the University of Florida- Institute of Food and Agricultural Sciences and FDACS Bureau of Apiary Inspection have developed a protocol for growers to document bloom status in Florida citrus. The document (Appendix C) should help growers understand when bloom begins and ends with respect to use restrictions present on many citrus insecticide labels.

FQPA INFORMATION

All risk considerations associated with the Food Quality Protection Act are addressed in the pending FIFRA Section 3 application under review by EPA's Registration Division.

COORDINATION WITH OTHER AFFECTED FEDERAL, STATE, AND LOCAL AGENCIES (166.20(A)(8)):

As EPA's state lead agency, the Florida Department of Agriculture and Consumer Services will be the focal point for this information distribution and coordination.

NOTIFICATION OF REGISTRANT (166.20(A)(9)):

Valent U.S.A. Corp. has been notified of this request. The company is supportive of this emergency exemption petition (See Appendix B for registrant support letters).

DESCRIPTION OF ENFORCEMENT PROGRAM (166.20(A)(10)):

As EPA's state lead agency, the Florida Department of Agriculture and Consumer Services will provide this information.

REPEAT USES (166.20(A)(11)):

This is the first request for the use of clothianidin to manage psyllids on young citrus trees. At this time, it is not anticipated that a repeat Section 18 will be required. The registrant has an action pending at the agency that would negate the need of an additional submission. When that action occurs, an SLN to cover the uses allowed under this Section 18 will be sought in Florida.

PROGRESS TOWARD REGISTRATION (166.25(B)(2)(II)):

Valent U.S.A. Corporation has a pending action before the agency to expand the existing use on non-bearing citrus to include bearing citrus. The establishment of the tolerance through that action would allow this use on immature but bearing citrus. The Agency has a projected decision date under PRIA of June 18, 2014 for that petition.

NAME OF PEST (166.20(B)(1)):

Scientific Names:

Disease:
Candidatus Liberibacter asiaticus (CLas)

Vector:
Diaphorina citri Kuwayama (Hemiptera: Liviidae)

Common Names:

Disease:
HLB, Citrus Greening, Yellow Dragon Disease

Vector:
Asian Citrus Psyllid, (ACP)

DISCUSSION OF THE EMERGENCY CONDITION (166.20(B)(2)):

In 2005, HLB, which is also referred to as citrus greening disease, was found to be present in Florida. This disease is caused by the pathogen *Candidatus* liberibacter asiaticus (CLas) and is spread by the Asian citrus psyllid (*Diaphorina citri* Kuwayama) which is an invasive pest and was first discovered in Florida in 1998. HLB is considered to be the most serious disease of citrus worldwide and has greatly limited commercial production of citrus in countries where it is present. Since its discovery in Florida, this disease has rapidly spread throughout the citrus production area and is currently found in all commercial production areas in the state.

As described in a recent publication (Hodges A.W., Spreen T. H. 2012. Economic Impacts of Citrus Greening (HLB) in Florida 2006/07-2010/11. Electronic Data Information Source (EDIS) FE802. University of Florida, Gainesville, FL; Available at: http://edis.ifas.ufl.edu/fe903), this disease and the resulting loss of production has cost the industry over $7 billion in lost revenue. This loss of production translates to over 8,000 jobs over the same five-year period. As trees succumb to the effects of the disease, the industry is faced with the challenge of replanting groves to replace the lost production.

Extensive research into the epidemiology and spread of the disease has indicated that while it spreads rapidly, the impact on mature trees can be managed to some extent to prolong the productive life of infected trees. The more insidious problem is the inability to adequately protect re-plantings to allow the young trees to reach production maturity at an incidence level of the disease that can be managed. Growers have been able to manage the disease incidence and transmission through the use of soil-applied neonicotinoids (i.e., imidacloprid, thiamethoxam and clothianidin) in non-bearing young trees (1 to 3 years-old, 1 to 5 feet tall). This has been accomplished by making precision dose applications to the soil at the base of the young trees at application intervals that provide season long suppression of feeding behavior of the psyllid. As has been discussed in the attached letters from citrus growers attempting to replace infected groves, this control breaks down rapidly, under current control options, in the 3 to 5 year-old larger tree size cohort (5 to 9 feet tall). Without the means to assure control of this pest complex in all age classes of immature trees, the risks associated with tree replacement outweigh the benefits associated with replanting.

With HLB disease well-entrenched throughout the citrus growing areas of Florida, the ability to replant and protect young trees is the most important problem facing Florida citrus growers. Since HLB has become widespread in Florida, growers have found that psyllid control programs for young trees (recommended by UF-IFAS), which are based in large part on the use of soil-applied neonicotinoid insecticides, can greatly reduce the likelihood of trees becoming HLB diseased within the first three years after planting. After that point, HLB disease begins to appear in these young tree plantings (> 3 years of age), the timing of which corresponds to the inability to keep trees protected from psyllid feeding due to limitations on the allowable use rate of the soil-applied neonicotinoid

insecticides (imidacloprid, thiamethoxam and clothianidin). As trees reach 5 feet in height, the product dose rate per tree must be proportionately increased to protect the larger size of tree. Thus, season-long protection of trees in the 5-9 foot size range cannot occur year-round given the current per acre, per year restrictions on the amount of neonicotinoid active ingredients that may be applied under present Section 3 labels.

In addition to these citrus grower experiences, research results from UF-IFAS also support these findings and emphasize the need for season-long use of neonicotinoid insecticides for protection of young trees. One of the unique characteristics of the soil-applied neonicotinoids is the prevention of transmission of the causal organism for HLB. This characteristic was discovered through feeding experiments using electrical penetration graph (EPG) monitors that demonstrated that soil-applied neonicotinoid insecticides prevent the phloem-feeding behaviors by the Asian citrus psyllid required for successful HLB pathogen infestation/inoculation of healthy plants. Briefly, when a psyllid begins feeding on a plant, more than 1 hour may elapse before its mouthparts reach the phloem system of the leaf and pathogen inoculation is possible. If a plant has been systematically treated with a neonicotinoid insecticide, psyllids get a "taste" of the imidacloprid in the leaf tissue and cease feeding long before they are able to successfully inoculate a healthy plant with the pathogen. (Serikawa, R. H., Backus, E. A. and M. E. Rogers. 2012. Effects of soil-applied imidacloprid on Asian citrus psyllid (Hemiptera: Psyllidae) feeding behavior. J. Econ. Entomol. 105 (5): 1492-1502). Of critical importance and the primary reason the soil-applied neonicotinoids are needed is the longevity of the anti-feeding effect exhibited under this application scenario. This soil-applied anti-feeding effect on psyllids lasts for at least 6 weeks, a time period significantly longer than the protection provided by any of the currently available foliar insecticide applications of pyrethroid, carbamate, organophosphate or other classes of chemistries (Rogers, 2012). The findings of laboratory-based studies proving feeding inhibition by the neonicotinoids preventing young trees from becoming HLB infected have been confirmed in "real world" ongoing multi-year field evaluations of new tree plantings. Twelve months after planting, trees treated with soil-applied neonicotinoid insecticides every 6 weeks, coupled with foliar insecticide sprays of products with different modes of action to mitigate resistance development to the neonicotinoids, have remained essentially HLB-free. These results are based on PCR analysis of experimental plants every 3 months. Conversely, trees treated either with monthly applications of foliar insecticides or left untreated currently have HLB infection rates of 2.5 and 3.8 percent respectively; again this is 12 months after planting (Appendix C).

The level of protection from HLB described above can be achieved for trees up to approximately 5 feet in height under current labels, depending on timing intervals and use rates per tree. However, trees larger than this size, typically those 3 years of age or older, can only be treated three times (2x imidacloprid; 1x thiamethoxam) under the current labels and become HLB infected at non-manageable levels long before reaching full bearing potential. Increasing the annual use rate to allow additional applications of soil-applied neonicotinoids will provide the best protection possible for this size of trees which is needed to provide continuity of citrus production in future years. As shown in

the referenced publication, this level of control is possible under the requested use scenario.

Losing as few as five percent of young citrus trees currently in the ground to HLB will result in lost viability of production in the long-term sense. Grower experience indicates a rapid increase in incidence of the disease when this anti-feeding behavior is reduced in longevity due to application timing gaps, or ineffective per tree rates created by current label restrictions. The only manner known at this time to assure tree life and viability of the industry is by sustaining protection of young trees.

The registrant and the industry are acutely aware of the intense pressure on clothianidin and this class of insecticides related to its perceived impacts on pollinators. We have attempted to mitigate as much as possible the direct exposure to the product during application and secondary exposure through weeds via specific use directions and label restrictions concerning tree size-specific dose rates. FDACS also stresses enhanced communication and cooperation among citrus growers and beekeepers, to help protect honey bees. With ongoing research efforts, additional information is being developed to address the potential exposure during the flowering period for citrus.

The primary exposure route for pollinators under this application scenario would be residues that would be found in the nectar. To minimize this exposure, the label only allows applications to be made from the end of bloom through November 1st of the same year. The residue results from the report of "Quantitation of Residues of Clothianidin, TZNG, TZMU in Nectar Following Soil Application of Belay Insecticide 2.13SC to Citrus" indicate that as time between applications and bloom increased, residues detected in nectar declined, as did the variance between individual samples collected from similar application timings. Therefore, limiting the use to a period from the end of full bloom to a point approximately 3 to 4 months before the following bloom will minimize exposure to pollinators. This is consistent with best management practices developed by the University of Florida which suggest that soil-applied neonicotinoids are most effective when applied to trees that are flushing with new growth. This generally occurs from March through October when Asian citrus psyllid populations are at their peak. Less than 15% of total trees in bloom will receive a soil application of a neonicotinoid. The other 85% are mature trees and are too large to benefit from this method of application. This significantly reduces risks to bees. If it is assumed that the available data represent the distribution of residues which may be present in citrus nectar under actual use conditions, then the 95th percentile concentration is below EPA's level of concern of acute risk to adult worker bees (5 ppb).

It is anticipated that with the support and cooperation of the Florida Department of Agriculture and Consumer Services, the formal guidance developed for beekeepers and growers over the past several months will be implemented to ensure minimization of risk to bees in the application sites where this labeling will be used.

Non-Routine Emergency Situation:

The rapid decline of HLB-infected mature citrus trees, as evidenced by the reduction in fruit size and quality, and with the dramatic increase of fruit drop as fruit reaches harvest maturity the past two years, requires the aggressive replanting of groves to sustain the processing infrastructure. The industry has not been able to sustain the immature trees through to full production without high levels of HLB infestation. The only mechanism presently available to do that is soil-applications of the neonicotinoid insecticides at a frequency to ensure protection of leaf flush from infected Asian citrus psyllid.

DISCUSSION OF ECONOMIC LOSS (166.20(B)(4)):

For the trees that would be treated with clothianidin under the Section 18, 3 to 5 year-old, 5 to 9 feet tall, the economic impact is easily described. With the use of clothianidin, the trees can be expected to reach production levels that would approximate the level of yields in young trees prior to introduction of the pest and diseases (approximately 2 to 3 boxes of fruit per tree). Without the protection afforded by the use of clothianidin, the trees do not reach market maturity before succumbing to the symptoms of the disease resulting in the complete loss of any productive value.

The Economic Impact of HLB on the Florida Citrus industry:

Below is a summary of previously published and presented material supplemented with current season data.

This report was prepared by Bob Norberg, Economist, Florida Citrus Mutual, Economic and Market Research Associates, January 2014, and supplemented with a table depicting Florida citrus production from 1996-1997 through 2013-2014. It summarizes several previously published reports regarding the economics of the Florida citrus industry and the impacts of HLB on Florida Citrus economics. Data from the most recent seasons is used to generate supplemental impacts based on the logic from the previous reports.

The reports highlighted in the summary are:

1. Hodges A.W., and Spreen T.H. 2012. Economic impacts of citrus greening (HLB) in Florida 2006/07-2010/11. Electronic Data Information Source (EDIS) FE802. University of Florida, Gainesville, FL. http://edis.ifas.ufl.edu/fe903.
2. Florida Citrus Industry Request to Florida Legislature for 2013 General Revenue Appropriation to FDACS. Program *State Investment in Partnership to Find Solutions for Citrus HLB Disease.*
3. Production Research Implications for Future Generations of Florida Orange Growers, Presentation by Robert Norberg, Economic and Market Research Associates, June 2013, Florida Citrus Mutual Annual Grower Conference.
4. Situation and Outlook for the 2013/14 Florida Citrus Season, December Forecast, Presentation by Robert Norberg, January 2014, Florida Citrus Mutual Board of Directors Meeting.

Economic Effects of Citrus Greening (HLB) in Florida:

Florida's iconic citrus industry is an essential part of the economy of Florida, especially in the 28 central and southern counties of Florida where citrus is grown and processed. The most recent study before HLB became endemic put the overall economic impact at $8.91 billion and 75,827 jobs provided.[i]

However, in 2012 economists calculated that over $4.5 billion in economic impact had been lost due the effects HLB on the Florida orange juice industry for the period 2006 to 2010. The report details the category of losses, including, direct economic impacts, indirect economic impacts and induced impacts. On average, the State's economy suffered with the loss of $908.2 million dollars each year, and 8,257 permanent jobs.

These losses are mainly due to the reduced production of Florida oranges versus a scenario without the effects of HLB in the citrus growing environment. Losing orange production is exacerbated by further losses of the value-added segment of the industry, that is fruit processing, juice manufacturing, and juice packaging and distribution. Since most of the orange juice sold in the United States is produced solely in Florida, this becomes a loss of economic benefits for Florida residents.

As the disease progresses, more losses are expected each year. An estimate of the most current losses are explained by looking at Florida citrus production statistics over the period prior to first detection of HLB in Florida (1996-1997 through 2005-2006) and the decline in production exerienced in the recent three years as a result of both accumulation of disease across the state as well as the cumulative decline due to multi-year chronic HLB infection (Table 1).

Losses have now reached levels that annual citrus production is less than half of what it was as recently as 2003-2004. The decrease in fruit harvested was 9% between 2010-2011 and 2011-12, and the current estimate will increase that loss over two years to over 21% decline in yield in the industry (As calculated, under EPA's TIER I for Significant Economic Loss Threshold).

Citrus groves in Florida have largely been infected since 2009, several years after the disease was first discovered. With widespread Asian citrus psyllid populations and increasing inoculum, the spread reached all 32 commercial production counties by 2009, and equally has infected the millions of dooryard citrus trees in Florida. With the exception of newly planted blocks of trees, essentially all commercial groves are infected. Expectedly, the range of tree infection within a grove is from low in newer plantings to approaching 100% in groves where ACP control has not been rigorously practiced and where removal of infected trees is not practiced.

Table 1. Florida Citrus Production Statistics during the Period 1996-1997 through 2013-2014.

Crop Production by Fruit Type 1996-1997 through 2013-2014				
Crop Year	Oranges	Grapefruit	Other Citrus	Total
	(1,000 Boxes)			
1996-1997	226,200	55,800	13,315	295,315
1997-1998	244,000	49,550	10,900	304,450
1998-1999	186,000	47,050	10,115	243,165
1999-2000	233,000	53,400	12,030	298,430
2000-2001	223,300	46,000	9,505	278,805
2001-2002	230,000	46,700	10,565	287,265
2002-2003	203,000	38,700	9,305	251,005
2003-2004	242,000	40,900	8,900	291,800
2004-2005	149,800	12,800	6,650	169,250
2005-2006	147,700	19,300	7,600	174,600
2006-2007	129,000	27,200	5,850	162,050
2007-2008	170,200	26,600	7,000	203,800
2008-2009	162,500	21,700	5,000	189,200
2009-2010	133,700	20,300	5,350	159,350
2010-2011	140,500	19,750	5,800	166,050
2011-2012	146,600	18,850	5,440	170,890
2012-2013	133,600	18,350	4,280	156,230
2013-2014	115,000	16,500	4,400	135,900

Source: USDA, National Agricultural Statistics Service, FASS, Florida Citrus Statistics
2011-2012, published February 12, 2013. Data for crop years 2012-2013 and estimates for 2013-2014 provided by USDA, NASS, FASS, Citrus Forecast, January 10, 2014.

With the rapid spread of the disease, and the increasing infection rates within standing groves, the situation that we are experiencing now in Florida is a combination of:

- Widespread infection of citrus trees throughout the growing region of Florida
- Heavy inoculum in infected trees available for acquisition by the vector, ACP. Recent samples indicate up to 100 percent of field-collected ACP are positive for CLas, the pathogen
- Limited removal of infected trees means that local spread can be rapid if psyllids are not managed effectively. With high rates of infection within a block, tree removal is not practical

- The accumulation of years of progressive infection by CLas means that a higher percentage of trees are beginning to show chronic infection, including more widespread symptoms within trees, thinner canopies and impaired root systems.
- These factors all contribute to the reduced fruit production (yield), even though the official acreage of citrus plantings has not declined significantly
- Fruit quality is declining, both in size, flavor and maturity

Thus, the productive population of mature trees is declining in health and productivity, and will likely continue to do so without effective therapeutics, which currently are not available. In addition, new citrus trees that are either inter-planted in existing groves of mature trees or planted solid in new blocks are at high risk to infection via the ACP vector bringing inoculum from infection sources. It is these new trees that will provide the ability for economic production of citrus to continue, and the confidence to replant is, at present, limited by early and fatal infection of young trees by CLas through psyllid transmission. Trees in the first 4-5 years of growth are particularly vulnerable since they grow new flush off-cycle when other trees are not producing new leaves. This makes them more attractive and susceptible to ACP colonization and disease transmission.

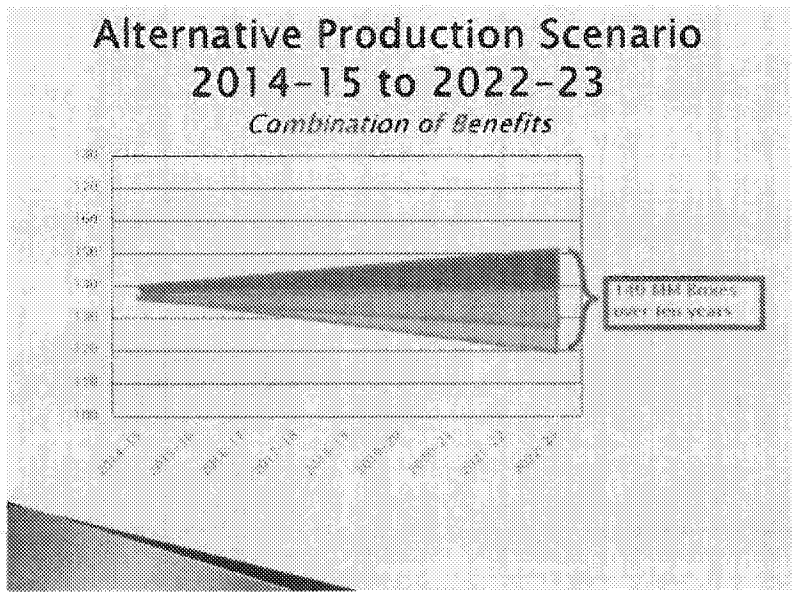
The importance of management of HLB in Florida citrus can be reduced to two major considerations. The first is to delay further health decline in existing mature trees that will further erode production. Second, and more vital, is the ability to manage ACP populations in young plants, thereby providing confidence to growers to replant.

Production Research Implications for Future Generation of Florida Orange Growers:

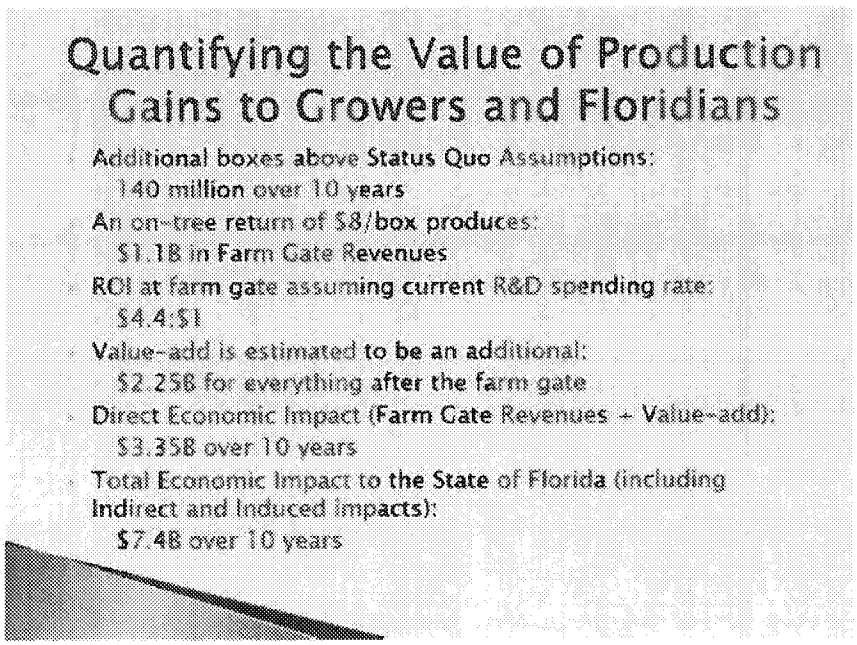
This presentation adds significant insights to the situation by attempting to quantify potential economic benefits to the State if research efforts change the trajectory of any one of several factors that affect the economic impact of citrus production (specifically oranges) in Florida.

The three factors examined in this presentation were: tree mortality rates, re-planting rates, and fruit yields. Reducing the mortality, and/or increasing the replanting rate, and/or improving fruit yields all have positive economic impacts. The following chart shows the combined effects on crop size with gradual improvements to these factors over the next ten years. Reducing the mortality rate from 4 percent to 3 percent in 10 years, increasing the planting rate from 2 percent to 3 percent over 10 years, and raising yields 1 percent per year would generate a total of 140 million additional boxes of fruit over the forecast horizon. Those additional boxes generate direct, indirect and induced economic impacts that would not be generated without them.

The following slides were taken from "Situation and Outlook for the 2013/14 Florida Citrus Season, December Forecast", a Presentation by Robert Norberg, January 2014, to the Florida Citrus Mutual Board of Directors Meeting.



The following slide from the presentation concludes that those boxes are worth $7.4 billion dollars during those ten years. Farm gate revenues would be enhanced by $1.1 billion dollars.



Further increases in pre-season fruit drop and reductions in fruit size were forecasted in the USDA January Crop estimate (Appendix C) and are expected to continue that trend in future production estimates. The reduced yields have contributed to the smallest orange crop since the freeze-impacted crop of 1989/90. It is uncertain, but likely, that these negative yield effects will be seen in future seasons without dramatic advances in production management practices, disease mitigation strategies, and solutions from the comprehensive research efforts.

Update on Economic Impacts, January, 2014:

Using the methodology previously established by Hodges and Spreen in their 2012 analysis, an updated estimate of the annual economic impacts of HLB (and other calamities) can be calculated. Although unit FOB (price paid to the grower by the processor) values have risen recently, these increases do not compensate for the loss of volumes since the value-added portion of total economic output is a significant factor and is directly correlated to volumes of orange juice case goods produced and distributed.

The following table shows the losses to be $3.3 billion over the period from 2011/12 to 2013/14 (January forecast) and 10,089 annual jobs. Combined with the losses estimated previously, losses to date from the 2006/07 season are $7.8 billion.

The annual rate of losses in both economic output and jobs is accelerating from the previous estimate. The average annual loss was $908.2 million per year between 2006/07 and 2010/11, while the annual loss rate for the period 2011/12 to 2013/14 is $1.1 billion. Currently total economic losses versus a non-HLB forecast is estimated to be $1.8 billion for the 2013/14 season based on the January crop forecast.

	Non-HLB	With HLB	Difference
2011/12 – 2013/14			
FOB REVENUES (MM)	$7,356	$6,103	($1,253)
DIRECT ECONOMIC OUTPUT (MM)	$7,088	$5873	($1,215)
TOTAL ECONOMIC OUTPUT	$19,245	$16,096	($3,149)
ANNUAL EMPLOYMENT	58,865	48,776	(10,089)

SECTION 18 EMERGENCY EXEMPTION FOR THE USE OF BELAY® INSECTICIDE FOR SUPPRESSION OF HUANGLONGBING DISEASE TRANSMISSION BY ASIAN CITRUS PSYLLID

VALENT®

BELAY®
INSECTICIDE

(EPA Reg. No. 59639-150)

For distribution and use only in the state of Florida

Active ingredient (Clothianidin)	**23.60 %**
Other ingredients	**76.40 %**
	100.00 %

Belay® Insecticide contains 2.13 pounds of the active ingredient clothianidin per gallon

Effective use date:
Expiration use date:
File identification:

For use in connection with an emergency exemption authorized under the provisions of Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended. This Section 18 label contains directions for use that do not appear on the EPA registered label of *Belay*® Insecticide. Please refer to the production label for additional information.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Always read and follow all label directions, restrictions and precautions when using any pesticide alone or in tank mix combinations. The most restrictive labeling applies when using a tank mix.

Applicable directions, restrictions and precautions on the registered product label for *Belay*® Insecticide (EPA Registration No. 59639-150) must be followed.

CITRUS FRUIT
Australian Desert Lime; Australian Finger-Lime; Australian Round Lime; Brown River Finger Lime; Calamondin; Citron; Citrus Hybrids; Grapefruit; Japanese Summer Grapefruit; Kumquat; Lemon; Lime; Mediterranean Mandarin; Mount White Lime; New Guinea Wild Lime; Orange, Sour; Orange, Sweet; Pummelo; Russell River Lime; Satsuma Mandarin; Sweet Lime; Tachibana Orange; Tahiti Lime; Tangelo; Tangerine (Mandarin); Tangor; Trifoliate Orange; Uniq Fruit; Cultivars, Varieties, and/or Hybrids of these

Soil Drench Application Method: Based on tree size, mix required dose in water and apply 8-12 fl oz of solution uniformly around the base of each tree, directed at the root zone. For optimal uptake and performance, keep soil moist for 7 days following application via irrigation or rainfall. To ensure efficacy, the application site around the base of the tree should be as weed-free as possible.

Feb 2014

SOIL DRENCH APPLICATION			
Disease Suppressed			**Pests Controlled**
Huanglongbing Disease Transmission by Asian Citrus Psyllid			Asian Citrus Psyllid
Soil Drench Rate Chart Based on Tree Height			
Tree Size	***Belay* Insecticide Rate/Acre**	***Belay* Insecticide Rate/Tree[1]**	**Application Restrictions**
New plantings or resets, less than 3 feet tall	3.0 fl oz/acre (0.05 lb ai)	0.02 fl oz/tree (0.0003 lb ai/tree)	Allow a minimum of 6 weeks between applications.
One to two year old trees, 3 to 5 feet tall	6.0 fl oz/acre (0.1 lb ai)	0.04 fl oz/tree (0.0007 lb ai/tree)	Allow a minimum of 6 weeks between applications.
Three to five year old trees, 5 to 9 feet tall	12.0 fl oz/acre (0.2 lb ai)	0.08 fl oz/tree (0.0013 lb ai/tree)	• Allow a minimum of 4 months between *Belay* applications. • Do not apply more than two applications per tree per 12 month period. • Do not apply *Belay* from November 1st through the end of the following bloom period.

[1]Application rates per tree are based on a population of 150 trees/acre.

Do not apply more than 12.0 fl oz per acre of *Belay*® Insecticide or exceed 0.2 lb active ingredient clothianidin per application per acre, regardless of tree size, tree count per acre or application method.

Do not apply more than 24.0 fl oz per acre of *Belay*® Insecticide or exceed 0.4 lb active ingredient clothianidin per acre per 12 months regardless of tree size, tree count per acre, or application method.

ENVIRONMENTAL HAZARDS

This product is toxic to aquatic invertebrates. Do not apply when weather conditions favor drift from treated areas. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.

This product is toxic to bees exposed to treatment and for more than 5 days following treatment. Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. Fall soil application of 3-5 year old citrus may pose risks to honey bees that forage in the trees during the winter/spring bloom. Applicators are advised to help mitigate such risks by cooperating with the Florida Department of Agriculture and Consumer Services in its efforts to communicate hive location/placement options with local bee keepers. For further information, see www.FloridaBeeProtection.org.

In the State of Florida: The properties of this chemical suggest it may leach into ground water if used in areas where soils are permeable and where the water table is very shallow. Do not apply within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or commercial fish farm ponds.

This labeling must be in possession of the user at the time of pesticide application.

Please contact Valent U.S.A. Corporation at 1-800-6-VALENT (682-5368) if you have questions regards use of this product.

Registrant: Valent U.S.A. Corporation
P.O. Box 8025
Walnut Creek, CA 94596-8025

Belay is a registered trademark of Valent U.S.A. Corporation.

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Use of soil-applied systemic neonicotinoids in citrus for young tree protection from Asian citrus psyllid feeding / Citrus greening pathogen transmission

Prepared by Michael E. Rogers, Associate Professor of Entomology, Unniversity of Florida, IFAS, Citrus Research & Education Center. (1/15/14)

The first table below shows what can currently be done based on currently labeled soil-applied neonicotinoids. The goal is to make application of soil-applied neonicotinoids every six weeks in order to provide the level of psyllid feeding disruption needed to prevent pathogen transmission.

The primary gaps that exist in the young tree program at this time are for the 5-9' tall trees. Only two applications of imidacloprid (Admire Pro) and one application of thiamethoxam (Platinum) are labeled for bearing trees of this size class. The remainder of the year, only foliar applied insecticides can be used and these foliar applications do not provide protection from disease because psyllids feeding is not prevented before insecticide induced mortality.

In the Florida Citrus young tree protection program, growers are seeing the greatest rate of new disease infections in the 5-9' tall size. This is due to a lack of soil-applied neonics applications resulting in large gaps in protection that can be provided.

What's currently possible

(foliar applications to prevent pesticide resistance to neonics shown in orange)

Tree size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reset (<3')	P		A		A		B		B		A	A		P
1-2 yr (3-5')	P		A		B		B		B		B	A		;?
3-5 yr (5-9') bearing				P		A		A						

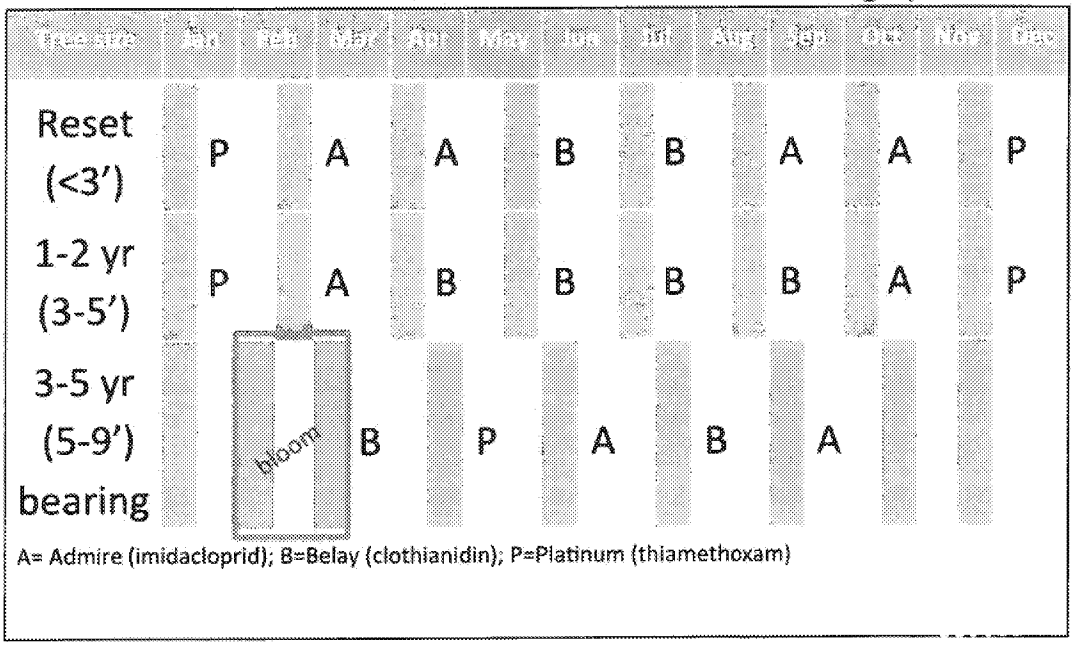
A= Admire (imidacloprid); B=Belay (clothianidin); P=Platinum (thiamethoxam).

The next table incorporates two soil-applications of clothianidin (Belay) into the young tree program for 5-9′ tall BEARING trees. This program provides applications every six weeks during the time of the year when psyllid populations are at their highest levels.

The red outline box indicates the 4-6 week period where bloom is likely for trees 5-9′ in height. [Note: the orange bar which indicates foliar-applied insecticide use during bloom will consist of products labeled for use during bloom.] Little or no bloom is anticipated during the same time period on the younger tree classes which are still juvenile and thus considered non-bearing.

Addition of Belay (bearing label)

(foliar applications to prevent pesticide resistance to neonics shown in orange)



Determining Percent Bloom in Florida Citrus Groves

Michael E. Rogers, Jamie D. Ellis, David A. Westervelt and L. Gene Albrigo [1]

In Florida, citrus bloom varies by year, typically occurring in 2-3 waves of flowering any time from February through the end of March. When citrus trees are in bloom, many pesticide labels prohibit application due to potential for negative effects on pollinators, particularly managed honeybees. The expected time of greatest foraging in blooming citrus by bees is from 10-90% open bloom for each cultivar. For Florida citrus growers, this would be the period when use of pesticides, which restrict application during bloom, should cease.

There are a number of factors that can influence when citrus trees will bloom including weather patterns, cultivar, expected yield, tree age, and soil type. Tree stress, such as drought stress probably occurs in HLB affected trees and causes trees to produce off-season bloom. Because low levels of off-season bloom can occur weeks to months in advance of "true abundant bloom", it is important to have a good understanding of when "true bloom" is likely to occur and focus efforts on monitoring bloom abundance at that particular time.

The Citrus Flowering Monitor (http://disc.ifas.ufl.edu/bloom/) is an online tool for Florida citrus growers that predicts when peak bloom is likely to occur in a growing area based on factors such as weather, cultivar, and growing conditions. When a prediction of peak bloom is obtained, growers should begin documenting bloom abundance in their groves at least 4 weeks prior to peak bloom to determine when the grove has reached or exceeded 10% bloom. At 10% bloom, the application of bloom prohibited pesticides should cease. Monitoring should also occur as the bloom period nears 90% completion, to document when pesticide applications can resume. The following sampling protocol can be used to determine the percent bloom in a citrus grove.

With the exception of grove edges, which receive more sunlight than the rest of the grove and are likely to bloom earlier, bloom is typically uniform throughout a grove and thus sampling to estimate bloom abundance can be performed with relatively minimal effort. Sampling bloom abundance is performed using a 2'x2' frame (made of PVC pipe or other material of choice) placed at the surface of the canopy of the tree and the total number of open blooms counted within the frame (to include those blooms deep inside the canopy) is divided by the total number of potential blooms (pinhead, popcorn, and open blooms) and multiplied by 100 to get % bloom. Towards the end of bloom, the total number of open blooms is counted and divided by the sum of the total number of potential blooms plus the number of fruitlets. Dividing the frame using string to create four quadrants may facilitate the ease of counting the numerous bloom stages that may be present. Counts should be taken at least at the midpoint of tree height; counting from a pickup bed will speed up the process.

[1]Michael E. Rogers, Associate Professor, Department of Entomology & Nematology, Citrus Research & Education Center, Lake Alfred, Florida; L. Gene Albrigo, Professor Emeritus, Department of Horticultural Science, Citrus Research & Education Center, Lake Alfred, FL; Jamie D. Ellis, Associate Professor, Department of Entomology & Nematology, Gainesville, FL; David A. Westervelt, Assistant Chief, Apiary Inspection Section, Bureau of Plant and Apiary Inspection, Division of Plant Industries, Gainesville, FL.

A total of 12 frame counts of bloom can be made to estimate bloom abundance in a cultivar. Choose two row middles (spaced approximately 1/3 and 2/3 across the block) to make counts. For each of the 2 row middles sampled, select 3 sampling locations evenly spaced down the row. At each stop, make frame counts of bloom abundance on two trees (one tree on the left side of the row middle [tree 1] and one tree on the right side of the row middle [tree 2]).

Table 1 is provided as a template for record keeping purposes for documenting the stage of bloom present. When 10% of the developing bloom (pinhead stage, popcorn stage or open flowers) have reached the open flower stage, then application of bloom restricted pesticides should cease. Conversely, when 90% of developing bloom has reached petal fall (developing fruitlets predominate) and less than 10% of developing fruit stages consist of open bloom, then pesticide applications can resume. In the event that questions should arise regarding application of pesticides during bloom, growers should retain documentation of bloom sampling used to time pesticide applications based on percent bloom along with your pesticide application records

Table 1. Data recording sheet for estimating percent bloom in a citrus grove.

Block Name: _____ Cultivar: _____ Date: _____

		Tree 1		Tree 2	
	Stop	# developing flowers[1]/ fruitlets[2]	# open blooms	# developing flowers[1] / fruitlets[2]	# open blooms
Row middle 1 (1/3 across grove)	1				
	2				
	3				
Row middle 2 (2/3 across grove)	1				
	2				
	3				
		Sum =	Sum =	Sum =	Sum =
		Column A	Column B	Column C	Column D

[1] includes pinhead stage, popcorn stage, and open flowers. [2]exposed fruitlets will be the predominant stage present when approaching 90% petal fall.

Sum Column A_____ + Column C _____ = (E)_____

Sum Column B _____ + Column D_____ = (F)_____

Percent bloom = total # open bloom (F) ÷ Total # developing buds (E)

[(F)_____ ÷ (E)_____] X 100 = _____Percent bloom

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